

preparations are open to the examination either of Prof. King or of any other naturalist interested in the question, on the simple condition that the results of such examination shall be made public in a form satisfactory to myself. I do *not* require that these results shall accord with my own; I only ask that simple facts of observation shall not be twisted into conformity with preconceived theories, and that, where accordance exists, it shall be freely admitted.

I remain, Gentlemen,
Your obedient Servant,
WILLIAM B. CARPENTER.

XIV.—*On some new Species of Diurnal Lepidoptera from South America.* By OSBERT SALVIN, M.A., F.L.S., &c., and F. DU CANE GODMAN, F.L.S. &c.

HAVING recently acquired several interesting collections from the eastern valleys of the Andes of Bolivia, Peru, and Ecuador, we hasten to publish descriptions of some of the most prominent of the species which appear to us to be undescribed. To these we have added others which have been recently sent to us from several parts of Central America and Mexico. It is not our intention to leave these species, of which we now merely give isolated descriptions, in this "unprotected" state; but as time shall enable us to work out the more difficult groups, we purpose giving a more detailed account of all the species contained in these collections, and a complete record of all the localities where the species were obtained. Besides the species here described, these collections contain others which we have little doubt are new to science, especially such as belong to the genus *Ithomia* and its allies; but as these groups require a more careful study than we have as yet been able to bestow upon them, we leave them for the present.

1. *Callitæra pyropina*.

♂. Exp. 2·85. Diaphanous, nervures brown; posterior wings with an evanescent band between the end of the cell and the anterior angle, and the whole of the outer margin diaphanous brown, broad at the posterior angle, where it encloses three round spots, between each of which and the margin is a narrow transverse streak; this portion of the wing is clothed, the transparent film with dark pink-coloured scales, the diaphanous brown portion with violet-coloured scales: between the radial nervures and close to the extremity of the wing is an ocellus of very dark blue scales, surrounded by the diaphanous

brown of the margin, this ocellus has a white pupilla, and there is another isolated white spot between the third median branch and the lower radial. The underside of the posterior wings differs from the upper as follows:—the pink-coloured spots are much paler, and the brown markings near the posterior angle are covered with scattered brown (instead of violet) scales: the ocellus has a buff submarginal ring.

♀. Larger, the wings more rounded, and the colours of the posterior wings more vivid; a small white spot appears in the centre of the pink spot between the second and third median branches.

Hab. Eastern Peru, Lower Huallaga (*E. Bartlett*), Pozuzo (*Pearce*).

Mus. S. & G.

Nearest to *Hetæra Esmeralda*, Dby., but is much larger, the wings more elongated, the pink spots on the posterior wing larger, and the colouring of this portion much more extended.

2. *Pierella rubecula*.

♂. Exp. 3·1. Brown, the anterior wings with a green opalescence; the posterior wings have the terminal half, except the actual margin, deep rufous, and two black ocelli at the anterior angle, that nearest the costa having a white pupilla: three narrow black bands, the inner two very faint, cross both wings, the outer band being nearly straight, the others convex; the innermost band, where it crosses the cell, is separated into distinct spots. The underside uniform and paler, washed with a purplish tinge and covered with faint darkish freckles; the cross bands are more distinct: there are also small distinct black spots at the base of both wings, and a series of indistinct white spots follow the ocelli; the anterior wings have three small white spots near the apex.

♀. Larger, the anterior wings less acute, and the general coloration darker, the markings being more distinct.

Hab. Guatemala, forests of Northern Vera Paz and valley of the Polochic (*Salvin & Godman*).

Mus. S. & G.

Near *Hetæra luna* (F.), but may be at once recognized by the very distinct rufous patch on the posterior wings.

3. *Hetæra pallida*.

H. luna, Hew. Ex. Butt. ii. t. 42. f. 3.

All specimens from Nicaragua resemble the drawing given by Hewitson as representing *H. luna* (F.). These differ from South-American specimens, which must be considered to be

the true *Papilio luna* of Fabricius, in being uniformly much paler in colour. This Nicaraguan race, having apparently permanent characters and a distinct geographical habitat, requires a name. We propose to call it *Hetera pallida*.

4. *Pierella ocreata*.

♂. Exp. 2·75. Dark brown, the anterior wings have three black bands crossing the cell, the middle one being prolonged to the inner margin; the end of the cell is also black: two parallel black bands cross the wing from the inner margin to the costa, the innermost traversing the third section of the median nervure; between these bands and the outer margin are a series of spots, that nearest the costa white, the next black, and the two following white: the posterior wings have three black cross bands, being the continuation of the first, second, and fourth of the anterior wing; beyond the third of these bands is a large white patch, followed by a red one, the latter having a transverse irregular lower margin, and enclosing a distinct white spot between the third median branch and the lower radial; beyond these patches the wing is darker, and has a white spot between the upper radial and subcostal nervures, and a pupillated black ocellus between the radials; the outer margin is rather deeply indented, the end of the third median branch carrying a somewhat prominent tooth; the indentations are all margined with buff. The general coloration of the underside is paler, the bands being more strongly shown; between the two parallel bands is pale greyish, which is continued on the posterior wings as a large angulated patch tinged with red over its lower portion: the neighbourhood of the anal angle is tinged with buff, and a buff line between two black lines follows the sinuations of the outer margin: a third white spot appears between the second and third median branches, and the ocellus has a buff submarginal ring. The anal patch, characteristic of the males of this section, is dark brown.

♀. Larger and darker, the anterior wings being less acute; the underside of the posterior wings has a fourth white spot between the first and second median branches.

Hab. Panama (*M'Leannan*), Veragua (*Arcé*).

Mus. S. & G.

Allied to *H. helvina* of Hewitson, from which it manifestly differs in having the upper portion of the red spot white.

5. *Antirrhæa pterocopha*.

♂. Exp. 3·85. Apex of the anterior wings not rounded, but abruptly obtuse, the outer margin being angulated at the

extremity of the upper radial; posterior angle definite and obtuse: posterior wings with the extremity of the first branch of the median nervure prolonged into an obtuse, and the third branch into an acute projection: anterior wings brown, with three bluish-white spots between the extremity of the cell and the outer margin: posterior wings brown at the base, black at the extremity, an irregular tawny spot at the anterior angle; posterior angle with a succession of three blue spots across the wing, that between the second and third branches of the median nervure whitish in the middle. Underside brown; a curved black band crosses both wings from the anal angle of the posterior wings to the extremity of the cell of the anterior; another, parallel line between this and the base of the wings: between these lines on the anterior wings is a median black line crossing the cell; all these lines have whitish outer margins gradually separating into freckles, so as to give the under surface a mottled appearance: outer margin of both wings deep tawny, a conspicuous black spot between the angle of the costal and subcostal nervures of the posterior wings. Antennæ brown.

Hab. Veragua (*Arcé*).

Mus. S. & G.

The specimen from which our description is taken is in bad condition, but is sufficiently perfect to enable us to point out the remarkable characters of this conspicuous species. We are not aware that it has any near ally.

6. *Oressinoma sorata*.

♂. Exp. 2·2. Like *O. typhla*, Klug, but differs in being larger, the posterior wings much more elongated at the anal angle, the anterior wings more angulated, and the outer margin straighter; the white band which crosses both wings is narrower and straighter; the indistinct submarginal markings of *O. typhla* are replaced by distinct white lunules on the hinder wings, and by a straight whitish line on the anterior wings; on the underside the buff submarginal edging of the posterior wings is less abruptly sinuated, and the white band has a dark inner margin.

Hab. Calcan, Northern Bolivia (*Pearce*).

Mus. S. & G.

7. *Acræa testacea*.

♂. Exp. 1·9. Both wings sooty, the nervures being rather darker; the anterior wings between the costal and median nervures, and almost as far as the end of the cell, brick-red; an oblique band of the same colour beyond the cell reaches

from the costa to the second branch of the median nervure. Underside paler, the posterior wings yellowish; the nervures and a line between them sooty. Antennæ black.

Hab. Apolobamba, Northern Bolivia (*Pearce*).

Mus. S. & G.

8. *Heliconius notabilis*.

♀. Exp. 3·1. Dark sooty black; anterior wings with two conspicuous white spots—one (quadrate) at the extremity of the cell, the other (oval) between the cell and the apex; the margins of these spots and a large patch contiguous to the inner one, and reaching to beyond the first branch of the median nervure, brick-red. Underside paler, the red spot only showing a pinkish tinge; the basal half of the costa of the posterior wings yellow; four red spots at the base of the posterior wings. Antennæ black.

Hab. Canelos, Eastern Ecuador (*Pearce*).

Mus. S. & G.

Allied to *H. Xenoclea*, Hew., but differs in having the spots of the anterior wings white and red, instead of red orange.

9. *Eueides lineata*.

♂. Exp. 2·4. Black; anterior wings with a broad arched band from the base, widening towards the outer margin and posterior angle, tawny orange; an oblique curved band, divided by the radial nervures, occupying the central portion of the apex, reaches to the costa; hind wings with the whole central portion tawny orange, the black margin extending almost to the cell along the nervules, and to a less distance between them. Underside red brown intermingled with yellowish about the apical third of the anterior wings: posterior wings having the nervules dark, a red-brown longitudinal mark between them, the base yellowish, and a row of thirteen white spots close to the outer margin. Antennæ black, a row of lateral white spots on the abdomen, and four on the head.

♀. Larger and paler.

Hab. Guatemala, valley of the Polochic (*H. Hague*).

Mus. S. & G.

10. *Eresia maesta*.

Exp. 2·55. Grey, both wings bordered with brownish black, the nervures being of the same colour; apex of the anterior wings with a row of four submarginal white spots; posterior wings with five white spots round the anterior angle and outer margin; a patch of tawny yellow along the inner margin and anal angle. Underside paler, the tawny patch more apparent, the base of the costa of the posterior wing

yellowish grey. Antennæ yellowish white, black at the base, the club being tipped with tawny orange.

Hab. Canelos, Eastern Ecuador (*Pearce*).

Mus. S. & G.

This species has some resemblance to *Ithomia cæno*.

11. *Eresia phædima*.

♂. Exp. 2·4. Anterior wings black; basal portion of the cell, part of the inner margin, and the whole space between the submedian nervure, the median and its first branch almost to the posterior angle, tawny yellow; terminal portion of the cell, a large patch between the first and second branches of the median nervure, and a smaller one between the second and third, dingy yellow; a series of three elongated spots of the same colour between the cell and the outer margin; six white submarginal spots between the nervules: posterior wing tawny yellow, with costal and outer margins black, the latter with six white submarginal spots. Underside paler, the white submarginal spots more prominent, the dingy yellow spots of the upper surface clear yellow; a central band of the same colour crosses the posterior wings, the costa of which is tawny yellow. Antennæ black, the club yellow.

♀. Larger. The basal tawny-yellow marks of the anterior wings more restricted, and the marks of the apical portion of the wing greyer and larger; the white submarginal spots of both wings more distinct: posterior wings with a white spot near the anterior angle next the margin. Underside with the markings of the terminal half of the anterior wings and the central portion of the posterior wings white. Antennæ with the basal third only black.

Head in both sexes black; fore part of the palpi and two spots between the eyes white. Abdomen tawny above, with a central black line, beneath yellowish white.

Hab. Pozuzo, Eastern Peru (*Pearce*).

Mus. S. & G.

12. *Callicore eupepla*.

The recent acquisition of a Venezuelan specimen of *Callicore Metiscus*, Dby., has convinced us that there are three very distinct races of this form of *Callicore*, which may be shortly characterized as follows:—

Callicore Metiscus, Dby. Gen. Diurn. Lep. t. 30. f. 5.

Has the refulgent spot of the anterior wings subtriangular, the inner edge being straight and cutting the median nervure at a slightly obtuse angle; between this spot and the base of the wing are a few scattered bluish scales. The refulgent

spot on the posterior wings is large and only slightly tinged on its inner edge with blue; beneath, the red of the anterior wings is confined to a quadrate spot within the cell; the bend only of the costa of the posterior wings is red, this colour not reaching to the base of the wing; a small branch, however, leads into the basal black transverse band.

Hab. Venezuela (*Sallé*).

Mus. S. & G.

Callicore eupepla, sp. n.

The refulgent spot of the anterior wings, except along the costa, reaches to their base, the lower portion being bluish. On the posterior wings the refulgent spot blends into a rich blue, which pervades the whole of the wing. Underside—a broad band of red crosses the anterior wings near their base: the costa of the posterior wings is red for two-thirds of its length, and beyond the termination of this colour is a quadrate spot, also red.

Hab. Costa Rica (*Carmirol*).

Mus. S. & G.

13. *Callicore phlogea*, sp. n.

The refulgent spots are narrower than in either of the preceding species, and, looking at both anterior and posterior wings, form a crescent-shaped mark; the posterior wings are suffused with blue; underside, the basal half of the anterior wings, except the base itself, is red. The costa of the posterior wings is red for two-thirds of its length, this colour branching at its base as in *C. Metiscus*.

Hab. New Granada, Bogota (*Sp. ex Dr. C. Felder*).

Mus. S. & G.

14. *Batesia hypoxantha*.

Like *B. hypochlora*, Feld. (Voy. Nov. t. 53. f. 1, 2), but differs in the following characters. The upper surface is greener where *B. hypochlora* is blue, a submarginal band of the same colour surrounding the outer margin of the posterior wings. The red spot of the anterior wings is pinker. Beneath, the hind wings are pure yellow, not green as in *B. hypochlora*, the last-mentioned species having a well-defined submarginal band of the same colour, whereas in the present insect this band is indistinct.

Hab. Pebas, Upper Amazon (*Hauxwell*).

Mus. S. & G. et H. W. Bates.

15. *Batesia hemichrysa*.

Like *B. hypochlora*, but differs in having the hind wings

beneath and the apical spot of the fore wings clear golden yellow instead of green. In the same way it differs from *B. hypoxantha*, which has these markings pale yellow. The submarginal band of the hind wings is distinct as in *B. hypochlora*.

Hab. Guadalquiza, Ecuador (*Pearce*).

Mus. S. & G.

We think that neither of these species can be justly referred to *B. hypochlora*, Feld. The plate above referred to represents the colouring of the underside of the hind wings as green, whereas in one of our proposed species this portion is yellow, and in the other golden, almost orange.

16. *Paphia cyanea*.

♂. Exp. 3·25. Apex of the anterior wings angular, posterior wings with a marginal appendage; wings glossy blue, black towards the costa and outer margin; a wide refulgent blue band crosses the hind wings from the posterior angle, past the end of the cell to beyond the second branch of the median nervure of the anterior wings; this band is followed by a spot of the same colour between the radial nervures, another being situated between the upper radial and subcostal nervures. Entire surface beneath silvery white, covered with minute transverse black lines, interspersed on the anterior wings with darker patches: posterior wings lighter, the anal half of the outer margin occupied with a buff-coloured elongated mark with a green margin, and containing five white lunules tipped externally with a blue followed by a black spot; palpi streaked with seven lines alternately black and white. Antennæ black, with whitish marks beneath.

Hab. Canelos, Ecuador (*Pearce*).

Mus. S. & G.

Certainly a *Paphia*, but quite unlike any member of the genus in coloration.

17. *Paphia tyrianthina*.

♂. Exp. 3·50. Like *P. centaurus*, Feld., but has the anterior wings more falcate and elongated; a short middle discoidal nervure is also present; the purplish tint is more diffused and less broken up by blue markings; the posterior wings have no marginal appendage; the underside is generally darker and the cross lines less distinct.

Hab. Apolobamba, Bolivia (*Pearce*).

Mus. S. & G.

18. *Morpho Justitiæ*.

♂. Like *M. theseus*, Deyr., but the base of the wings is rich brown instead of hoary grey, the margin is much darker, and the brown spots clearer, the submarginal row of the hind wings being further from the margin, the dentation of which is deeper; the anterior wings are more acute and elongated beneath, the markings within the cell are less distinct, while those in the neighbourhood of the two ocelli, between the branches of the median nervure, are much clearer, and approach nearer to the ocelli; the pale band above the ocelli of the posterior wings is narrower in *M. Justitiæ*.

Hab. Guatemala, valley of the Polochic (*Hague*).

Mus. S. & G.

19. *Eurygona aurantiaca*.

♂. Exp. 1.75. Above tawny orange; the apical half of the anterior wings and the anterior angle of the posterior wings black, the inner edge of the former irregular; inner margin of the hind wings dusky. Beneath yellowish white, an indistinct band crossing both wings beyond the cell; a row of indistinct submarginal spots. Antennæ brown, the club black.

Hab. San Geronimo, Vera Paz (*Hague*).

Mus. S. & G.

Like *E. Teleclus*, Stoll, but the tawny yellow of the upper surface is much more extensive; beneath it is much less silvery and the marks less distinct.

20. *Eurygona Hieronymi*.

♂. Exp. 1.30. Above dark brownish black, with a line of tawny red running parallel to the inner margin of the posterior wings. Beneath greyish brown; a narrow tawny band edged with black crosses both wings beyond the cell, and another faint band between it and the outer margin: hind wings with a black spot, edged externally with white between the second and third branches of the median nervure; two whitish dashes edged with black near the anal angle; a succession of indistinct marks surround the outer margin. Antennæ black and white, the club black.

Hab. San Geronimo, Vera Paz (*Hague*).

Mus. S. & G.

21. *Euterpe nigrescens*.

♂. Exp. 2.70. Like *E. Eurytele*, Hew. Ex. B. i. t. 5. f. 1; but the tawny colour of both wings is brighter orange, the yellow spots of the anterior wings are also paler, and there are two elongated yellow spots between the submedian ner-

vure and the first branch of the median; the base of the anterior wing is blacker. Beneath blacker; instead of a large black spot near the middle of the costa of the posterior wings, a black streak unites with the black of the outer margin; wide black marks extend over the vicinity of the median nervure and its branches. Antennæ wanting.

Hab. Guatemala, valley of the Polochic (*Hague*).

Mus. S. & G.

22. *Pieris Josepha*.

♂. Exp. 3·25. Near *P. Josephina*, Gdt. (Hübner, Ex. Schm. ii. t. 126), but differs in the contour of the posterior wings. These wings in *P. Josephina* are elongated, the outer margin being much rounded, the anal angle only slightly projecting; the third branch of the median nervure is fully ·15 longer than in *P. Josepha*, which has the outer margin more straightened, the anal angle prominent, and the wing wider and more triangular. The geographical distribution of the two races is as follows:—

P. Josephina, Antilles (Haiti, and Cuba).

P. Josepha, Guatemala (valley of the Polochic) and Mexico (Oaxaca), Nicaragua.

Mus. S. & G.

We have several specimens of both sexes of both species, and find the above differences constant. Hübner's figure seems to have been undoubtedly taken from an Antillean specimen.

23. *Papilio Fenoehionis*.

♂. Exp. 3·55. Like *P. Epidaus*, Bdv., anterior wings more transparent; whole of the outer half of the posterior wings, except a submarginal row of white lunules and two red spots, black. The central longitudinal band is continued into this black spot instead of stopping abruptly at the end of the cell. Beneath, the central red band is edged on both sides by black instead of only on the inside; the whole of the outer portion of the posterior wings, as on the upperside, is sooty black, with a submarginal single row of white lunulate spots.

Hab. Oaxaca, Mexico.

Mus. S. & G.

24. *Papilio euterpinus*.

♂. Exp. 3·95. Wings rounded, entire, the costa much arched, the outer margin of the posterior wings slightly sinuated, but without projecting dentation: black; the upper margin of the cell of the anterior wings and the portion without the cell of the posterior wings thinly sprinkled with yellow scales; a curved band of brick-red colour occupies the greater

portion of the cell, and, extending thence towards the posterior angle, is cut by the second and third median nervures. Beneath browner, the margin of the brick-red band of the anterior wings black, the apical portion of the same wings and the whole surface of the posterior wings thinly covered with yellowish scales. Head and antennæ black.

Hab. Guadalquiza, Ecuador (*Pearce*).

Mus. S. & G.

This fine species is quite unlike any other known member of the genus. It must be placed with *P. Zagreus*, Dby., and its allies. Instead, however, of assuming the garb of *Lycorea*, it takes that of the underside of *Euterpe Callinice*, Feld.

25. *Papilio xanthopleura*.

♂. Exp. 5·80. Anterior wings elongated, acute, the outer margin only slightly concave; outer margin of the posterior wings deeply indented, the third branch of the median nervure bearing the longest projection; inner margin very hairy: black, each space between the nervules terminating at the outer margin of the anterior wings with an elongated, indistinct greenish line; the end of the cell of the posterior wings followed by four radiating patches, separated only by the nervules, bluish green; an oval spot of the same colour between the branches of the subcostal nervure and a similar triangular spot near the anal angle; a row of seven similarly coloured spots surrounds the wing near the margin, the indentations of which are narrowly edged with white; the spot nearest the anterior angle nearly white. Underside brown, the apex of the anterior wings paler; indistinct yellow markings about the end of the cell, and others, rather greener, near the posterior angle, those nearest the margin being divided by the median fold: posterior wings with a row of seven submarginal brick-red spots edged with black; above the spot, at the anal angle, is a subtriangular yellow mark. Antennæ black; a yellow spot behind the eye, another on either side of the origin of the maxillary palpi, others of the same colour on either side of the prothorax, the base of the wings, and the middle of the front part of the thorax; abdomen black, dark brown beneath, with a large yellow patch on either side.

Hab. Eastern Peru, Lower Huallaga (*Bartlett*).

Mus. S. & G.

Allied to *P. Corcebus*, Feld. (Voy. Nov. t. 13. f. *a, b*), but abundantly distinct. The remarkable yellow patch on either side of the abdomen distinguish this fine species from every

other of this group. It is, probably, the largest of the American Papilionidæ.

26. *Papilio soratensis*.

♂. Exp. 4·40. Costa moderately curved, posterior angle rounded, outer margin concave; posterior wings dentated, the branches of the median nervure bearing the longest projections: greenish black; a double row of round yellow spots crosses the anterior wings beyond the cell to the posterior angle; the outer margin towards the same angle also yellow: posterior wings with a series of six submarginal, lunulate, greenish spots; all except that next the anterior angle followed by macular blue spots, which are again followed by seven linear greenish spots; the spot at the anal angle reddish, the indentations of the hind wings yellow. Beneath, anterior wings black, with the apex and the whole of the posterior wings brown; the spots corresponding to the series of the upperside are larger, and there is an elongated transverse spot within the cell: the posterior wings are crossed beyond the cell by a curved band with a dark inner margin, the outer edge being deeply indented; a series of pale, lunulated spots near the outer margin; an orange spot with a black centre at the anal angle, followed inwardly by a black spot with bluish centre; there are yellowish hairs along the inner margin. Antennæ black; head, thorax, and abdomen black; a yellow spot on either side of the maxillary palpi; underside of the abdomen tawny.

Hab. Apolobamba, Bolivia (*Pearce*).

Mus. S. & G.

The only species that at all resembles this in form is *P. Cacicus*, Luc.; but from this it materially differs in the arrangement of its markings.

BIBLIOGRAPHICAL NOTICES.

Principles of Geology, or the Modern Changes of the Earth and its Inhabitants considered as illustrative of Geology. By Sir CHARLES LYELL, Bart., M.A., F.R.S. Tenth and entirely revised Edition. In two Volumes, 8vo. Vol. i. 1867; vol. ii. 1868.

Siluria. A History of the Oldest Rocks in the British Isles and other Countries; with Sketches of the Origin and Distribution of Native Gold, the General Succession of Geological Formations, and Changes of the Earth's Surface. By Sir R. I. MURCHISON, Bart., K.C.B., &c. &c. &c. [Third Edition.] Fourth Edition including the 'Silurian System.' With Geological Map and numerous Illustrations. 8vo, 1867.